Beginners Training for Safe Handling of Radiation and Radioisotopes at Tohoku University

VIII. 1. Beginners Training for Safe Handling of Radiation and Radioisotopes at Tohoku University

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This report summarizes the beginners training for safe handling of radiation and radioisotopes at Tohoku University from 2016 to 2017. Twice a year (in May and in November), we organize two lecture courses, namely 1) Radiation and Isotopes, 2) X-ray Machines and Electron Microscope and practices. Since November 2002, we have also organized lectures in English for students or researchers who are not familiar with Japanese language. Persons who have intension to work in synchrotron radiation facilities used to participate Synchrotron Radiation (SOR) course which was begun since 1995. From 2016, we stopped to offer SOR course, and those persons take the lecture of 1) Radiation and Isotopes, instead. The training is held under the help for lectures and practice from various departments and research institutes of the university.

The training for "Radiation and Radioisotopes" is for persons who use unshielded radioisotopes and accelerators, and has been conducted from 1977. The contents of lectures and practices are shown in Table 1. The departments or institutes to which trainees belong and the distributions of trainees are shown in Table 2 and Table 3.

The training for "X-ray machines and electron microscopes" started at the end of 1983. The training is scheduled at the same time as that for "Radiation and Radioisotopes". In this course, only lectures are given with no practice. The contents of lectures are shown in Table 4. The departments or institutes to which trainees belong and the distributions of trainees are shown in Table 5 and Table 6.

Table 1. Contents of the lectures and practices for "Radiation and Radioisotopes" in 2016 and 2017.

Lectures (one day)	Hours
Introduction to radiation	0.5
Effects of radiation on human	1.0
Radiation physics and measurements	1.0
Chemistry of radioisotopes	1.0
Radiological protection ordinance including video	1.5
Safe handling of radioisotopes	1.5

Practices (one day)	Hours
Treatment of unsealed radioactive solution	4.0
Measurement of surface contamination and decontamination	1.0
Measurement of gamma-rays and beta-rays	2.0

Table 2. Distribution of trainees for “Radiation and Radioisotopes” in 2016.

Department	Staff	Student	Total	English class
CYRIC	4	6	10	0
Medicine	8	30	38	3
Dentistry	3	6	9	2
Pharmacy	1	41	42	0
Science	3	88	91	9
Engineering	10	150	160	19
Agriculture	2	35	37	0
Research Institutes	33	81	114	20
The others	0	0	0	0
Total	64	437	501	53

Table 3. Distribution of trainees for “Radiation and Radioisotopes” in 2017.

Department	Staff	Student	Total	English class
CYRIC	0	5	5	2
Medicine	8	35	43	0
Dentistry	2	3	5	1
Pharmacy	0	32	32	0
Science	2	101	103	7
Engineering	6	164	170	16
Agriculture	0	37	37	0
Research Institutes	20	115	135	25
The others	0	0	0	0
Total	38	492	530	51

Table 4. Contents of the lectures for “X-ray machines and Electron microscopes” in 2016 and 2017.

Lectures (one day)	Hours
Safe handling of X-ray machines	1.5
Radiological protection ordinance	0.5
Video for safe handling of radiation and radioisotopes	0.5

Table 5. Distribution of trainees for “X-ray machines and Electron microscopes” in 2016.

Department	Staff	Student	Total	English class
CYRIC	0	0	0	0
Medicine	12	0	12	1
Dentistry	4	7	11	0
Pharmacy	2	3	5	0
Science	0	34	34	2
Engineering	8	204	212	10
Agriculture	1	2	3	0
Research Institutes	13	83	96	24
The others	0	0	0	0
Total	40	333	373	37

Table 6. Distribution of trainees for “X-ray machines and Electron microscopes” in 2017.

Department	Staff	Student	Total	English class
CYRIC	0	0	0	0
Medicine	0	4	4	1
Dentistry	9	13	22	0
Pharmacy	1	1	2	0
Science	0	16	16	2
Engineering	9	201	210	19
Agriculture	0	2	2	0
Research Institutes	15	73	88	14
The others	0	0	0	0
Total	34	310	344	36